## **CLAIMS**

What is claimed is:

5 1. A method of producing metal hydride misch-metal composite powders, the method comprising the steps of:

providing to a rotary flow-through electrodeposition apparatus a powder whose particles comprise one or more lanthanide alloy metals selected from the group consisting of titanium lanthanide alloy metals and nickel lanthanide alloy metals; and

electrodepositing one or more non-lanthanide metals on the powder via the apparatus.

- 2. The method of claim 1 wherein the electrodepositing step comprises completely encapsulating the particles with the one or more non-lanthanide metals.
- 3. The method of claim 1 wherein the electrodepositing step comprises only partially encapsulating the particles with the one or more non-lanthanide metals.
- 4. The method of claim 1 additionally comprising the step of electrodepositing crystalline catalytic elements after the step of electrodepositing one or more non-lanthanide metals.
- 5. The method of claim 4 wherein the step of electrodepositing crystalline catalytic elements comprises electrodepositing one or more noble metals.
- 25 6. The method of claim 5 wherein the step of electrodepositing crystalline catalytic elements comprises electrodepositing one or more of palladium and platinum.

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- 7. The method of claim 1 wherein in the electrodepositing step the one or more non-lanthanide metals comprises one or more of nickel, copper, tin, and zinc.
  - 8. A composition of matter produced by the method of any of claims 1-7.
- 9. A metal hydride misch-metal powder comprising a powder whose particles comprise an inner core comprising one or more lanthanide metals and a porous outer encapsulant comprising one or more non-lanthanide metals.
- 10. The powder of claim 9 wherein said particles additionally comprise crystalline catalytic elements on outer surfaces of said particles.
- 11. The powder of claim 10 wherein said crystalline catalytic elements comprise one or more noble metals.
- 12. The powder of claim 11 wherein said crystalline catalytic elements comprise one or more of palladium and platinum.
- 13. The powder of claim 9 wherein said one or more non-lanthanide metals comprises one or more of nickel, copper, tin, and zinc.
  - 14. The powder of claim 9 wherein said inner core additionally comprises one or more of nickel and titanium.